
TCSUH Special Seminar

Superconducting and Cryogenic Technology for Aircraft Propulsion Systems

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HSC 102: 12:00PM – 1:00PM



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ABSTRACT:

Environmental and economic pressures lead to a need, in the aerospace industry, to develop ever more efficient passenger aircraft. Further progress may necessitate a move away from the conventional 'tube and wing' configurations seen today toward more radical designs. One possibility is the use of distributed propulsion, in which the production of thrust is decentralized from the engines, allowing higher effective engine bypass ratios for greater propulsive efficiency and the possible exploitation of aerodynamic improvements, such as through boundary layer ingestion to reduce drag. However, electrical distributed propulsion with conventional electrical machines and cables would pose significant challenges, since the propulsive power required by modern passenger aircraft is in the order of MW and 10s of MW. A fully superconducting electrical system, from generators through distribution to fan motors, may be light and efficient enough to allow such a system to be economical in the future. This talk will present some of the activities being carried out by Airbus Group Innovations on the subject of superconducting aircraft propulsion systems. Requirements and technology targets for superconducting system components (machines, cables etc.) and cryogenics will be discussed.

BIO:

Frederick Berg is a research engineer in the Power Architectures group at Airbus Group Innovations in the UK. He is involved in research on hybrid-electric powertrains for aircraft propulsion, including the enabling superconducting technology. He received his PhD and undergraduate degree in aerospace engineering at the University of Bath, UK. Airbus Group Innovations is the Airbus Group network of research facilities, scientists, engineers and partnerships. Airbus Group Innovations has over 800 researchers in 8 countries and collaborates with a worldwide network of universities and research institutes.

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